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SUMMARY OF THE 1991-92 SOUTH PACIFIC ALBACORE FISHERY DATA

By

Gary M. Rensink

ADMINISTRATIVE REPORT LJ-93-10

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INTRODUCTION

Albacore were targeted by longline and troll fisheries in the south Pacific Ocean during 1991-92. Longline vessels from Taiwan, Korea, Japan and various south Pacific nations fished during the entire year of 1992. Troll vessels (jigboats) from the United States, New Zealand, French Polynesia, and Canada fished a season lasting from December 1991 through April 1992.

The Western Fishboat Owners Association (WFOA) and the Southwest Fisheries Science Center, distributed logbooks to U.S. vessels before the fishing season began. Completed albacore logbooks were then collected, or data were abstracted from vessel logs, by National Marine Fisheries Service (NMFS) representatives in American Samoa during and at the end of the fishing season. Direct and transshipment landings were sampled for sizes of fish. Catch-effort and size composition data were also collected from U.S. vessels landing in Tahiti by local scientists with EVAAM.

This report summarizes data collected from the U.S. fleet for the 1991-92 fishing season, and compares them to similar data from previous seasons. Available data from foreign fisheries are also presented for comparison.

BACKGROUND

U.S. troll vessels first started albacore fishing in the south Pacific in 1986, when two vessels conducted an exploratory fishing/research survey operation (Laurs 1986). The fleet grew steadily to a high of 58 vessels in 1990-91, then decreased slightly to 55 vessels during 1991-92 (Figure 1). Likewise, landings have increased from 89 mt in 1986 (Rensink 1992) to a high of 5,540 mt in 1990-91 before decreasing to 3,016 mt in 1991-92.

The average U.S. troll vessel fishing for albacore in the south Pacific since the 1989-90 season has been 60-70 feet (18-21 m) long with a hold capacity of 50+ short tons (45+ mt). During the 1991-92 season a typical vessel traveled to American Samoa or Tahiti (French Polynesia) from Hawaii and/or the U.S. West Coast, then ran 7-10 days to reach the fishing grounds. The vessel then spent 60 days fishing, offloading catches 2-3 times to carrier vessels at sea before returning to port with the last load. The carrier vessels offloaded the albacore at canneries in American Samoa. Albacore were landed by U.S. jig boats directly in American Samoa, French Polynesia and California (Table 1). Unlike previous years, Thailand and Fiji received no U.S. troll-caught albacore during the 1991-92 season.

COVERAGE RATES

NMFS and EVAAM port samplers collected catch and fishing effort statistics from logbooks, and measured fork lengths of individual fish (length-frequency data) from landed catches in American Samoa, Tahiti and California (Table 1). Coverage rates for catch-and-effort and length-frequency were calculated as the ratio of sampled landings in weight to total landings. Length-frequency samples taken from each vessel were usually 50 fish, and if a vessel was sampled the total landing was considered covered.

Logbook catch-and-effort sampling coverage declined from 69% for the 1990-91 season to 60% in 1991-92. Length-frequency coverage declined from 63% in 1990-91 to 55% in 1991-92. These drops in coverage were due to a larger number of vessels transshipping their catch at sea, which prevented effective collection of data.

TOTAL CATCH AND EFFORT

The number of U.S. vessels participating in the fishery (December 1991 through April 1992) decreased to 55 from 58 during the 1990-91 season. An estimated 3,500 days fishing (total landed catch/catch per day) were expended by the U.S. fleet during the 1991-92 season, compared to 3,800 days fishing during the 1990-91 season. The decrease in effort was due to the smaller fleet, and poor fishing during most of the fishing season. Catches were highest in January 1992 (35°-40°S and 150°-155°W) (Figures 2a-f). Total catches decreased significantly for the first time since the inception of the fishery, dropping to 3,016 mt for the 1991-92 season, 46% less than the 5,540 mt landed in 1990-91 (Table 2). This may have been due to an El Niño event in the Pacific Ocean during early 1992, which caused U.S./ vessels to explore areas east of 125° W for the first time (Figure 2f). Region-wide troll catches also declined, from 8,344 mt in 1990-91 to approximately 7,000 mt for 1991-92, a decrease of 16%.

Non-U.S. fisheries in the south Pacific have shown no consistent trends in catches of albacore (Table 2). New Zealand troll catches increased to 3,856 mt in 1991-92 compared to the 2,464 mt caught during 1990-91. French Polynesian troll catches declined from 326 mt to around 72 mt for the 1990-91 and 1991-92 seasons respectively. 1992 longline catch figures for the entire south Pacific are not available (Table 3), but data shows that landings have been stable from 1989 through 1991. Foreign longliner landings in American Samoa through the end of November 1992 show an 18% increase (191 landings totaling 19,868 mt) compared to the same period during 1991 (224 landings totaling 16,826 mt).

CATCH PER EFFORT

Catch per effort (CPE) was calculated from logbook information and is given by

$$\frac{\sum_{i=1}^{N} (C/E)_i}{N}$$

where C is the total number of fish caught by the ith vessel, E is the number of days fished by the ith vessel, and N is the number of vessels sampled. The CPE for the U.S. south Pacific albacore fleet decreased from 192 fish (1.4 metric tons) per day fished in 1990-91 to 130 fish (0.9 metric tons) per day fished in 1991-92 (Figure 3). The highest catch rate, an average of 267 fish per day, occurred in January 1992 approximately 1,000 miles south of French Polynesia (Figure 4).

Approximately 93% of the U.S. albacore catch during the 1991-92 season occurred from January to March, and came from an area between 35-45°S and 135-165°W (an Index Area/Season based on historical catches). CPE for this time period/area was 140 fish (1.0 metric tons) per day, 8% higher than the overall CPE (Figure 5), and 37% lower than the 221 fish (1.7 metric tons) per day recorded for the same time period/area the previous year.

LENGTH FREQUENCY

Over 5,000 albacore were measured for fork length (tip of snout to fork of the tail) from the landings of U.S. vessels. Overall, the average size of albacore measured decreased from 16.6 pounds (7.5 kg) in 1990-91 to 14.8 pounds (6.7 kg) in 1991-92 (Figure 6). Fish sizes ranged from 41 to 102 cm (Figure 7). The overall size distribution of fish caught by U.S. troll vessels showed distinct modes for 2 and 3 year-old fish. Size distributions varied according to geographic locations. A larger percentage of albacore >75cm were caught east of 120°W (Figure 8) although sample sizes for these areas were small. These size distributions may not represent the actual population because some vessels might not have landed the smaller fish.

SUMMARY

Highlights for the 1991-92 U.S. south Pacific albacore fishery include a decrease in landings from 5,540 mt in 1990-91 to 3,016 mt, a decrease in catch per effort (CPE) from 192 fish per day fished in 1990-91 to 130 fish per day fished, and a decrease in the average size of fish caught from 16.6 pounds (7.5 kg) in 1990-91 to 14.8 pounds (6.7 kg).

ACKNOWLEDGEMENTS

I thank the captains and crews of the U.S. south Pacific albacore fishing fleet, and William Perkins of the Western Fishboat Owners Association for their cooperation and continuing support of this program. I also thank Gordon Yamasaki of the American Samoa Laboratory of the NMFS Southwest Region, and members of his staff for distributing logbooks and collecting albacore fishing information during the fishing season. I also gratefully acknowledge the catch-effort, length-frequency and landings data provided to us by Stephen Yen and his staff in French Polynesia, and landings data from Fiji by Peniasi Kunatuba.

Atilio Coan Jr., Norman Bartoo, and Gary Sakagawa of the Southwest Fisheries Science Center reviewed drafts of this report and provided useful comments. Ken Raymond/Henry Orr/Roy Allen and Karen Handschuh illustrated many of the figures, and Karen Handschuh finalized the tables and typed the final draft of the manuscript.

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Laurs, R. Michael. 1986. U.S. albacore trolling exploration conducted in the south Pacific during February-March, 1986. NOAA-TM-NMFS-SWFSC-66. 30 p.

Rensink, Gary M. 1992. Summary of the 1990-91 U.S. south Pacific albacore fisheries data. NOAA Admin. Report LJ-91-14. 22 p.

Table 1. Sampling coverage for the U.S. South Pacific albacore fishery by landing location for 1990-91 and 1991-92 fishing seasons.

Landing Location	Total Landings (mt)	Landings Sampled (mt)	Coverage	Number of Landings	Sampled Landings
1990-91					
Catch and Effort:					
A. Samoa	4,217.5	3,139.2	74%	161	102
California	0.0	0.0	n/a	0	0
Fiji	46.2	0.0	n/a	1	0
Tahiti	586.9	432.6	74%	20	12
Thailand	689.5	276.3	40%	27	10
Unknown	0.0	0.0	n/a	0	0
TOTAL	5,540.1	3,848.1	69%	209	124
Length-Frequency:					
A. Samoa	4,217.5	3,103.5	74%	161	123
California	0.0	0.0	n/a	0	0
Fiji	46.2	0.0	n/a	1	0
Tahiti	586.9	389.1	66%	20	11
Thailand	689.5	0.0	0%	27	0
Unknown	0.0	0.0	n/a	0	0
TOTAL	5,540.1	3,492.6	63%	209	134
1991-92					
Catch and Effort:					
A. Samoa	2,170.5	1,271.3	59%	101	54
California	354.9	250.3	71%	21	12
Fiji	0.0	0.0	n/a	0	0
Tahiti	475.1	271.5	57%	26	16
Thailand	0.0	0.0	n/a	0	0
Unknown	15.3	15.3	100%	2	2
TOTAL	3,015.8	1,808.4	60%	150	84
Length-Frequency:					
A. Samoa	2,170.5	1,285.4	65%	101	51
California	354.9	211.6	60%	21	10
Fiji	0.0	0.0	n/a	0	0
Tahiti	475.1	149.3	31%	26	15
Thailand	0.0	0.0	n/a	0	0
Unknown	15.3	15.3	100%	2	2
TOTAL	3,015.8	1,661.6	55%	150	78

Catches of south Pacific albacore in metric tons by fisheries, 1952-1992.

YEAR	LONGLINE	POLE AND LINE		SPORT	DRIFTNET			TROLL					OTHER	GRAND TOTAL
	TOTAL	JAPAN	AUSTRALIA	AUSTRALIA	JAPAN	TAIWAN	KOREA	NEW ZEALAND	UNITED STATES	CANADA	FRENCH POLYNESIA	FIJI		
1952	154													154
1953	803													803
1954	9,578													9,578
1955	8,625													8,625
1956	7,281													7,281
1957	8,757													8,757
1958	18,636													18,636
1959	17,841													17,841
1960	22,248	45												22,293
1961	23,742													23,742
1962	35,219													35,219
1963	30,487	16												30,503
1964	22,301													22,301
1965	24,198													24,198
1966	32,444													32,444
1967	40,572													40,577
1968	29,221							5						29,235
1969	24,452							14						24,452
1970	31,585		200					+						31,835
1971	31,882		200					50						32,082
1972	31,132		200					+						31,600
1973	48,980		200					268						49,664
1974	33,700		200					484						34,798
1975	24,928		200					898						25,774
1976	32,914		200					646						33,139
1977	42,724		200					25						43,095
1978	32,460		200					621						34,346
1979	27,155		200					1,686						28,169
1980	31,283	19	100					814						32,870
1981	33,593	8	100					1,468						35,786
1982	30,279	1		50				2,085						32,764
1983	24,648	2		50	32			2,434						25,479
1984	20,955			50	1,581			744					3	25,366
1985	28,053			50	1,928			2,773					7	33,295
1986	35,563			50	1,936			3,253					11	39,549
1987	29,160			50	919			1,911	89					32,107
1988	31,215			50	4,271	1,000		1,227	751					40,260
1989	21,714			50	13,263	8,520	172	330	3,253	140			1	52,200
1990	20,915			50	5,667	1,859		5,161	3,068	162	90			35,273
1991	21,663			50		821		2,525	3,898		359			30,878
1992	(18,521)	49		100				2,464	5,540		326	13	1	(25,668)
								3,856	3,016	54	72			

Provisional estimates are given in parentheses; "+" denotes small catches of unknown size

[1] Longline, Pole & Line, and Sport figures are annual.
[2] Driftnet and Troll figures are seasonal (i.e. the 1990 figure is for the 1989-90 season).
[3] Other figures are from local American Samoa landings of unknown gear types.
[4] Australia sport figure for 1992 includes 55 mt taken by commercial trollers.

Primary sources: Fifth South Pacific Albacore Research Workshop Report (draft), Annex's 2 and 3.

Table 3. Longline catches of south Pacific albacore in metric tons, 1952-1992.

YEAR	JAPAN	KOREA	TAIWAN	FRENCH POLYNESIA	SOLOMON I.	TONGA	NEW CALEDONIA	AUSTRALIA	NEW ZEALAND	FIJI	TOTAL
1952	154										154
1953	803										803
1954	9,578										9,578
1955	8,625										8,625
1956	7,281										7,281
1957	8,757										8,757
1958	18,490	146									18,636
1959	17,385	456									17,841
1960	21,638	610									22,248
1961	23,412	330									23,742
1962	34,620	599									35,219
1963	29,120	1,367									30,487
1964	19,390	2,911									22,301
1965	17,793	6,405									24,198
1966	21,627	10,817									32,444
1967	15,104	13,717	11,751								40,572
1968	6,659	10,138	12,424								29,221
1969	4,894	9,963	9,595								24,452
1970	5,297	11,599	14,689	+							31,585
1971	3,472	14,482	13,928	+							31,882
1972	3,027	14,439	13,666	+							31,132
1973	2,550	17,452	28,974	+	4						48,980
1974	1,868	12,194	19,638	+							33,700
1975	1,333	9,015	14,580	+							24,928
1976	2,054	12,212	18,642	+	6						32,914
1977	2,328	13,176	27,211	+	9						42,724
1978	2,845	10,989	18,617	+	9						32,460
1979	2,274	8,682	16,178	+	21						27,155
1980	2,216	10,852	18,190	+	25						31,283
1981	4,203	14,793	14,595	+	2						33,593
1982	4,899	12,586	12,680	+	8	106					30,279
1983	5,723	6,669	12,082	+	19	143	12				24,648
1984	3,804	5,730	11,155	+	19	135	112				20,955
1985	3,868	14,267	9,601	+	12	174	131				28,053
1986	4,426	18,799	11,913	+		206	179	40			35,563
1987	4,490	8,646	15,009	+		252	563	200			29,160
1988	7,469	5,600	17,120	+		242	584	200			31,215
1989	5,365	3,997	10,867	(<100)		195	566	600	19	5	21,714
1990	6,428	2,586	9,689	156		191	1,053	300	249	263	20,915
1991	4,401	1,225	14,030	146		175	750	195	325	416	21,663
1992	(5,000)	(375)	(11,000)	300		(185)	(500)	145	706	310	(18,521)

Provisional estimates are given in parentheses; "+" denotes small catches of unknown size

[1] 1958-1987 catches for Korea include some taken in the north Pacific.
[2] The accuracy of figures for Taiwan for 1971-1983 has yet to be resolved.
[3] 1989-1992 estimates for Australia include Australia/Japan joint-venture catches.
[4] 1992 estimates for Japan, Taiwan, and Tonga are averages of the landings recorded for 1989-1991.
[5] 1992 estimate for Korea is based on half of the landings in American Samoa being caught in the south Pacific.

Primary source: Fifth South Pacific Albacore Research Workshop Report (draft), Annex 2 (South Pacific Commission 1993)

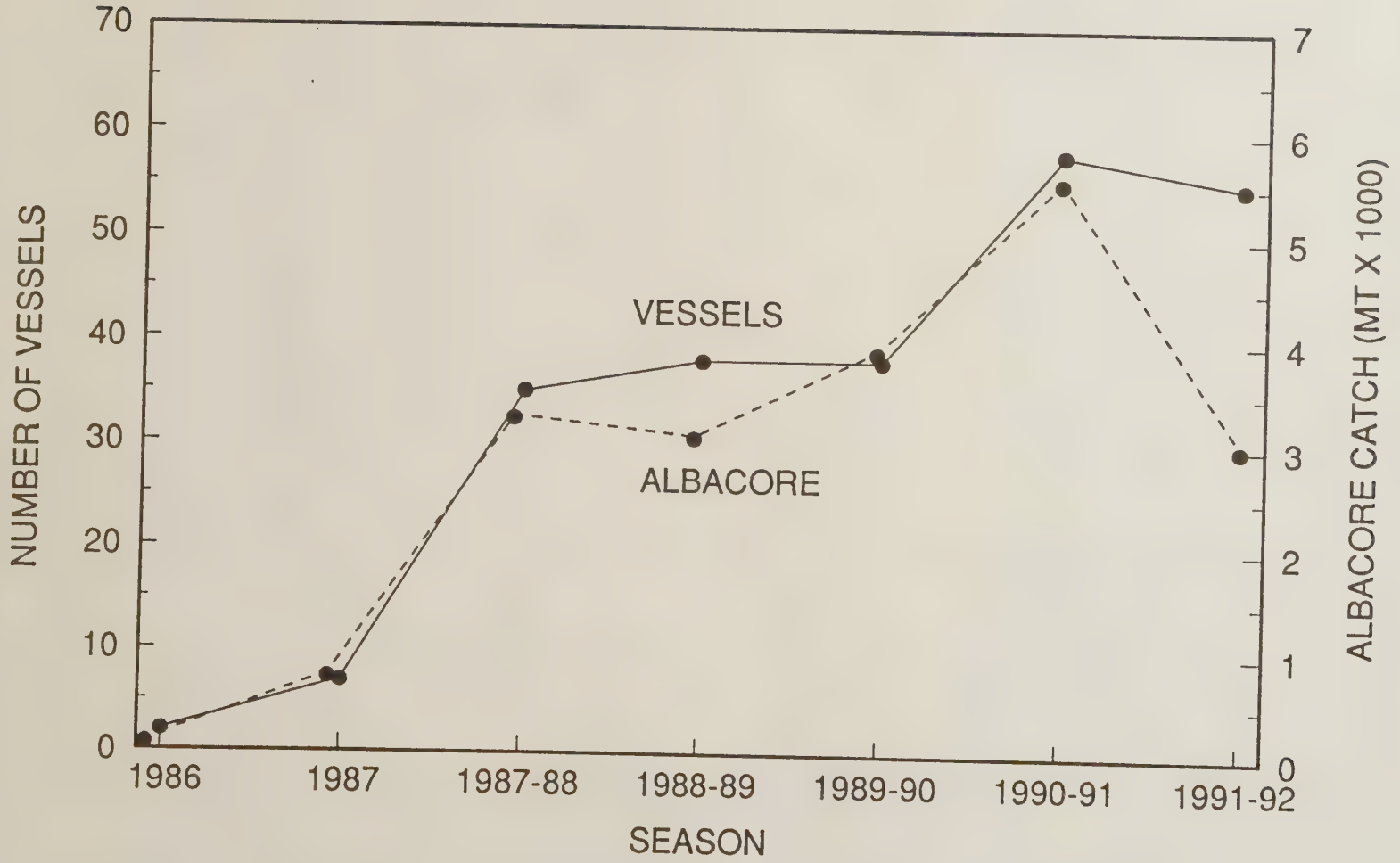

Figure 1. Number of U.S. troll vessels and albacore catch (metric tons) in the south Pacific by season, 1986-1992.

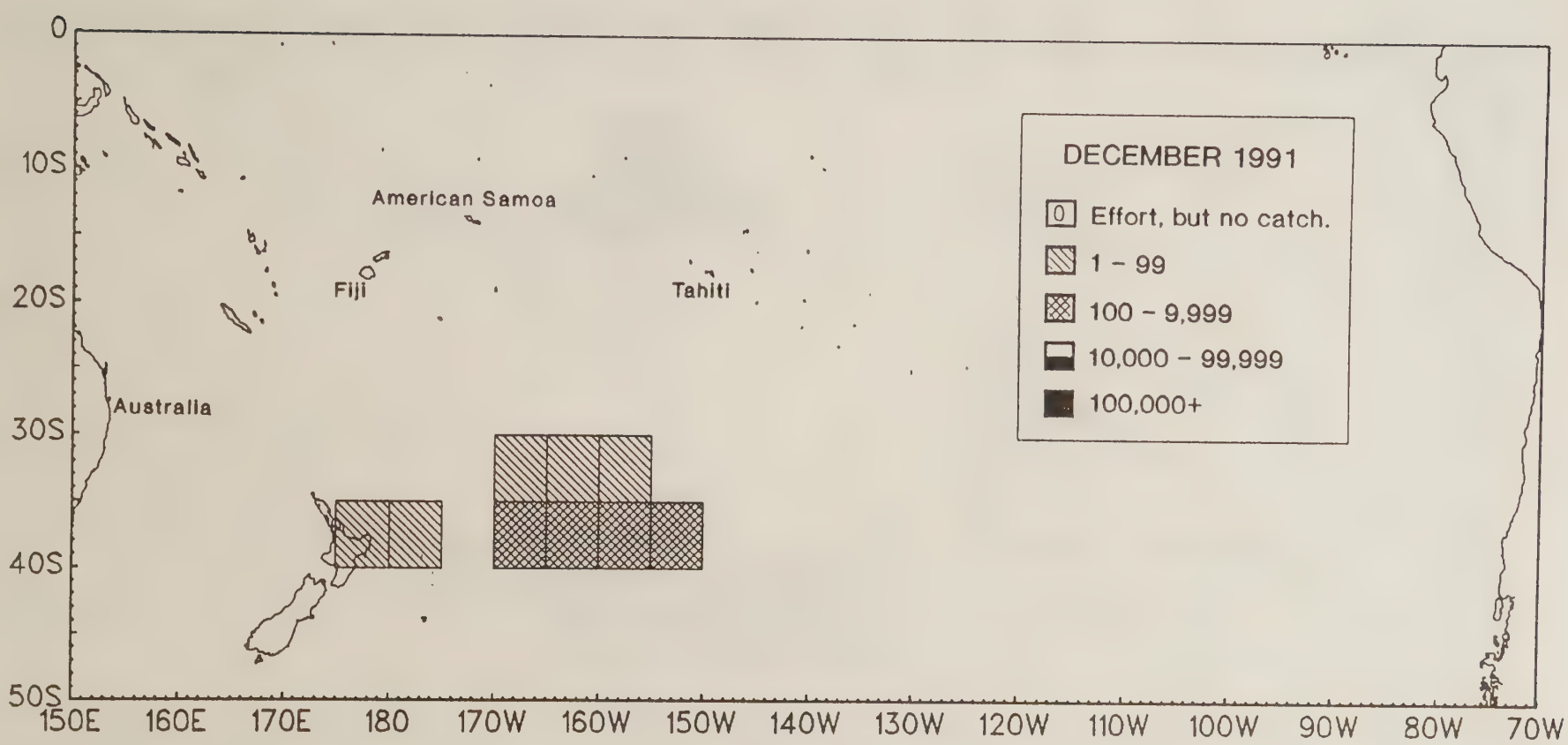

Figure 2a. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, December 1991.

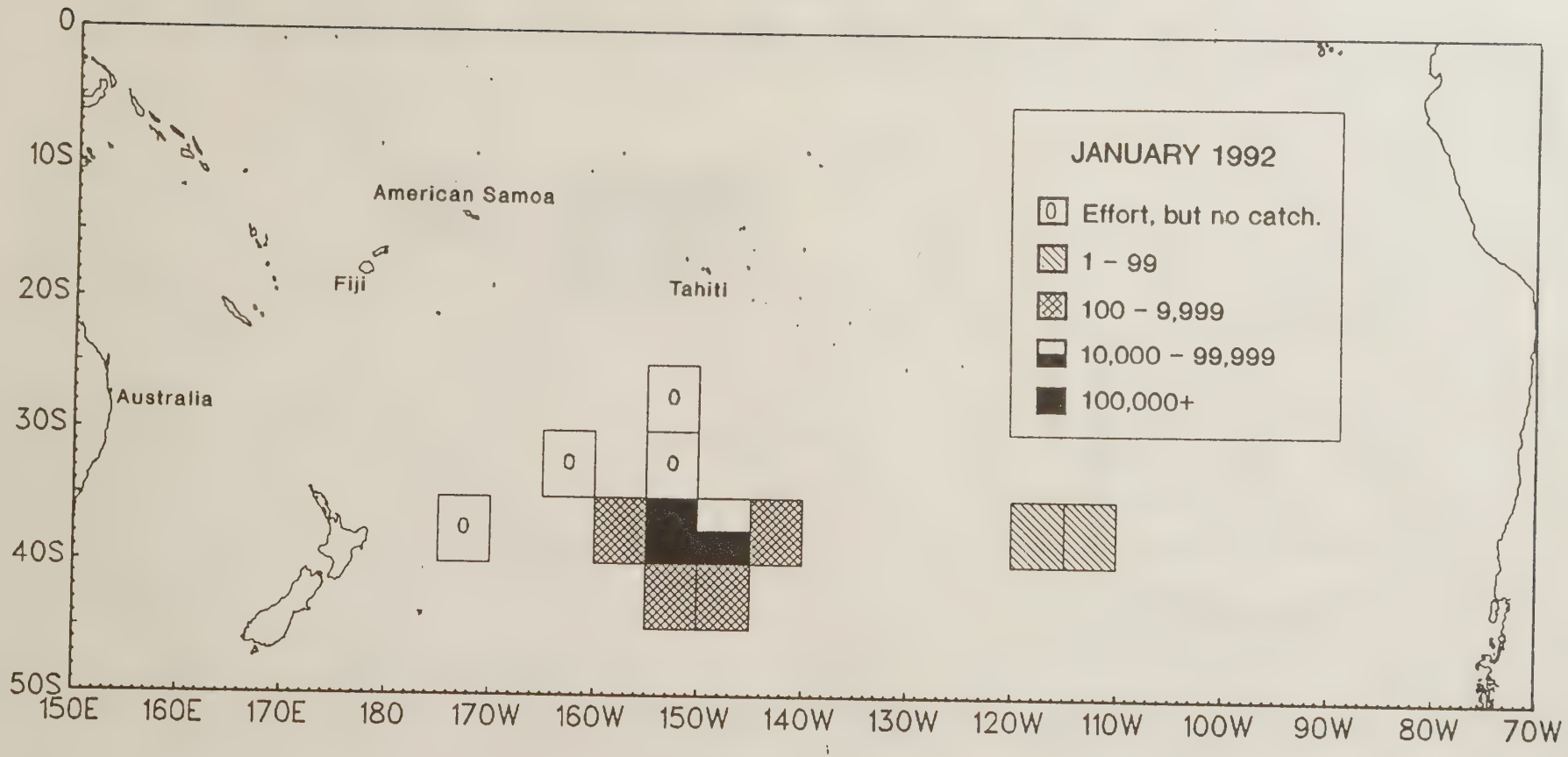

Figure 2b. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, January 1992.

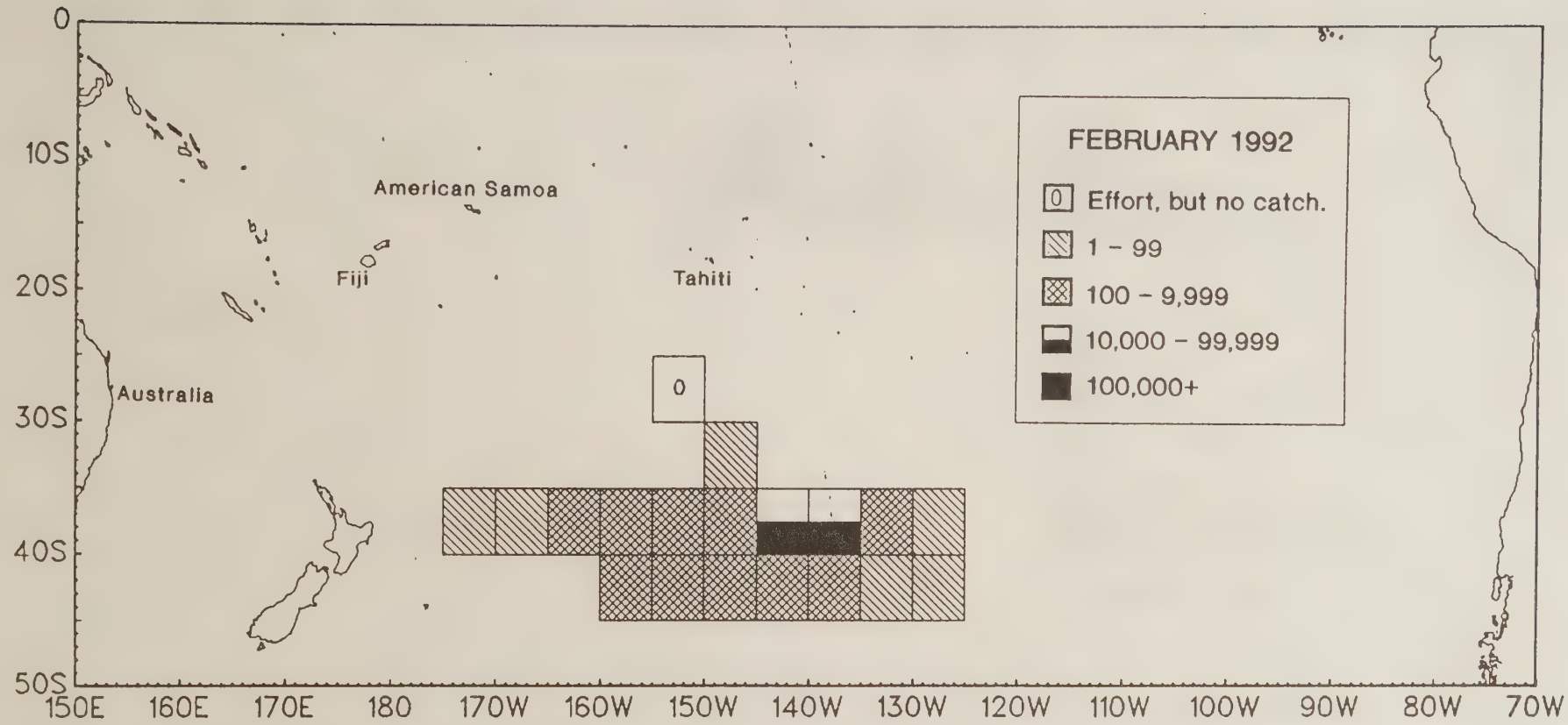

Figure 2c. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, February 1992.

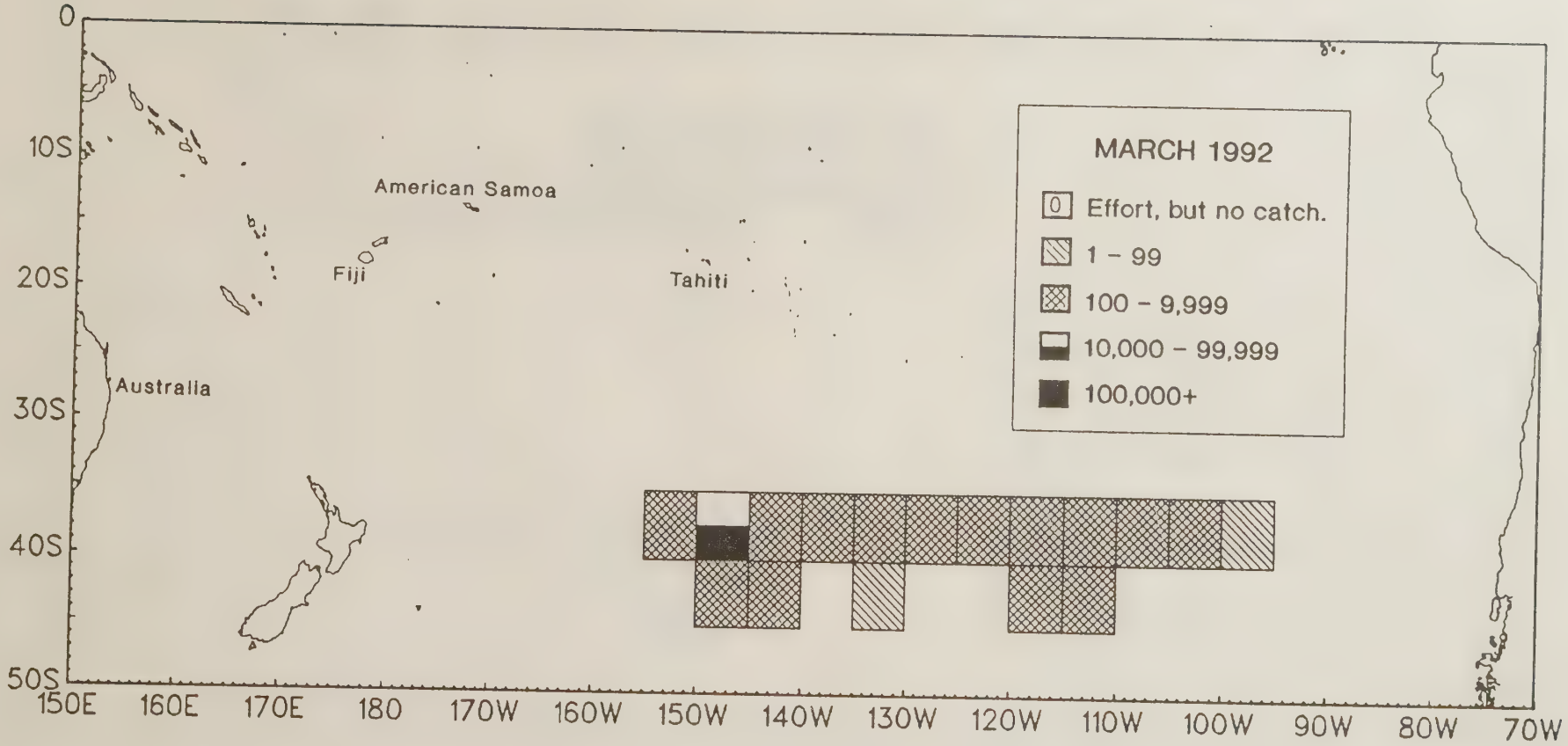

Figure 2d. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, March 1992.

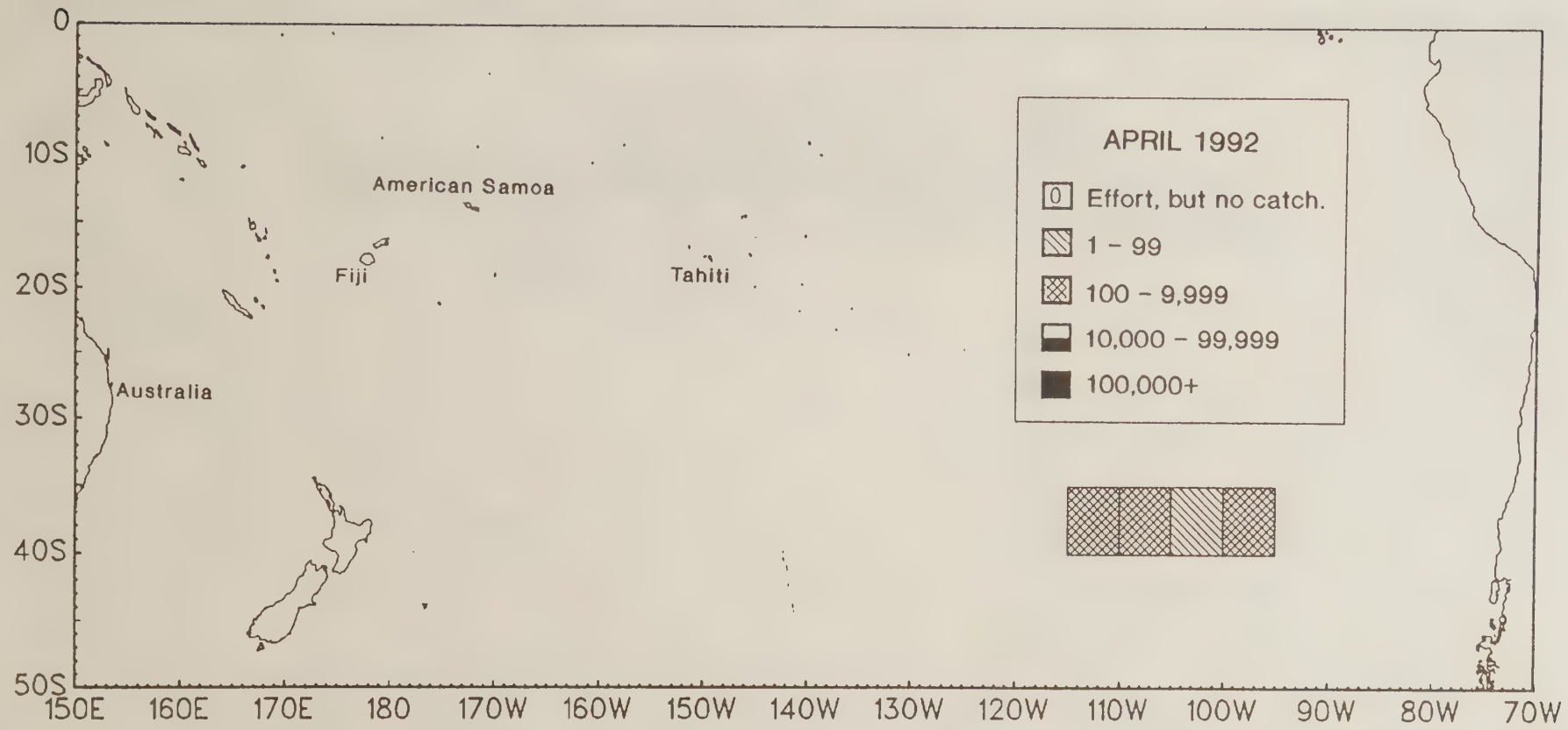

Figure 2e. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, April 1992.

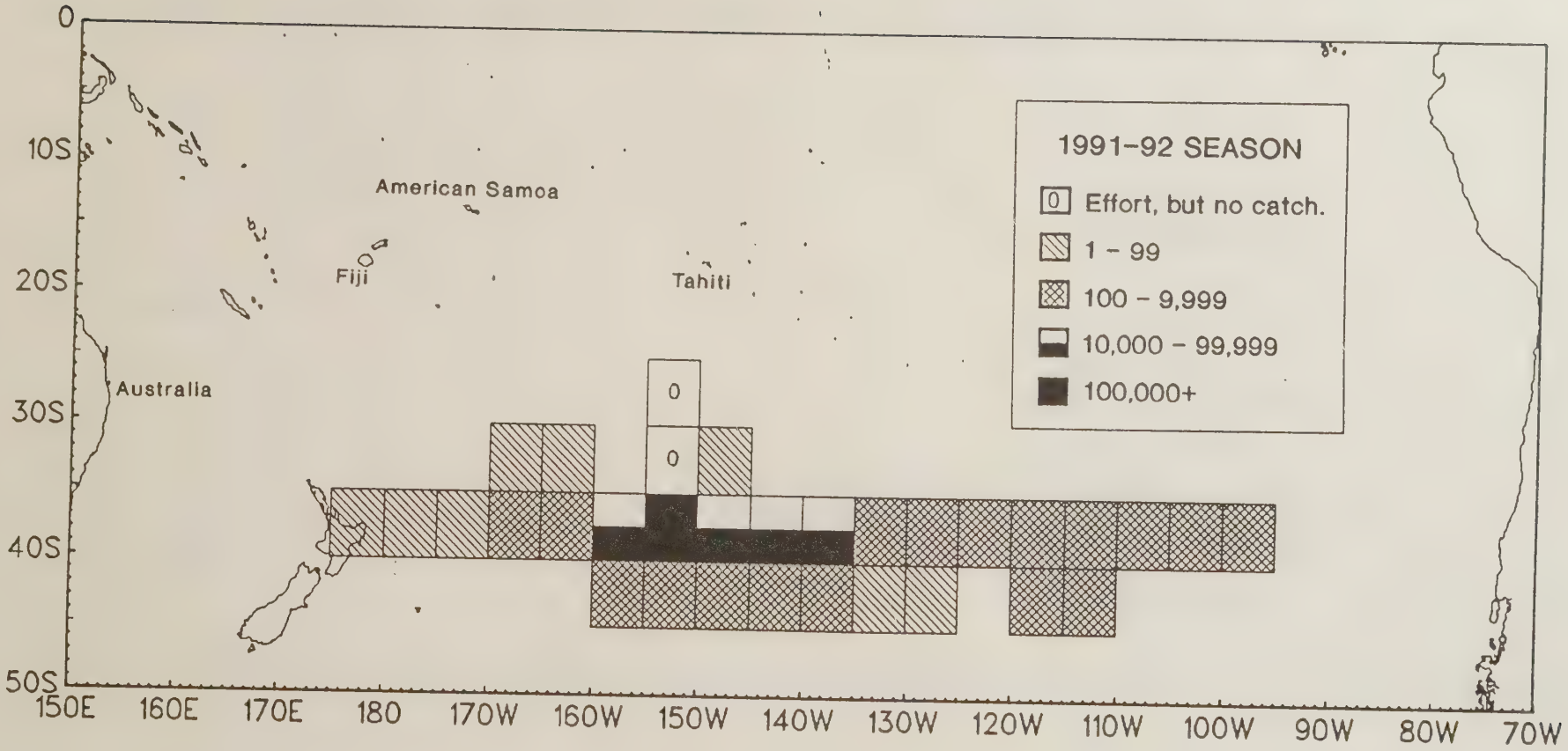

Figure 2f. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, 1991-92 season.

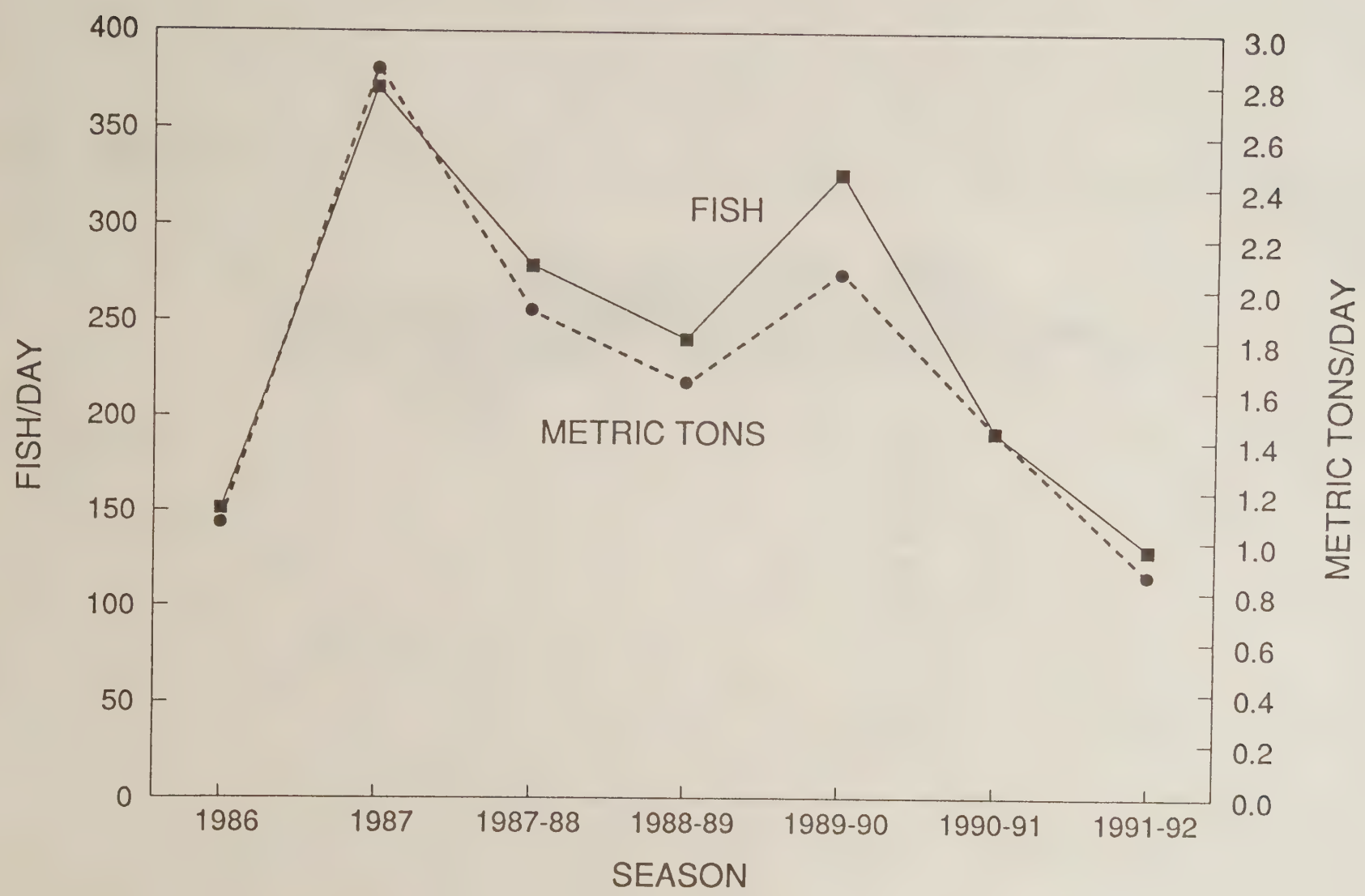

Figure 3. U.S. south Pacific albacore catch per effort (CPE) by season, 1986-92.

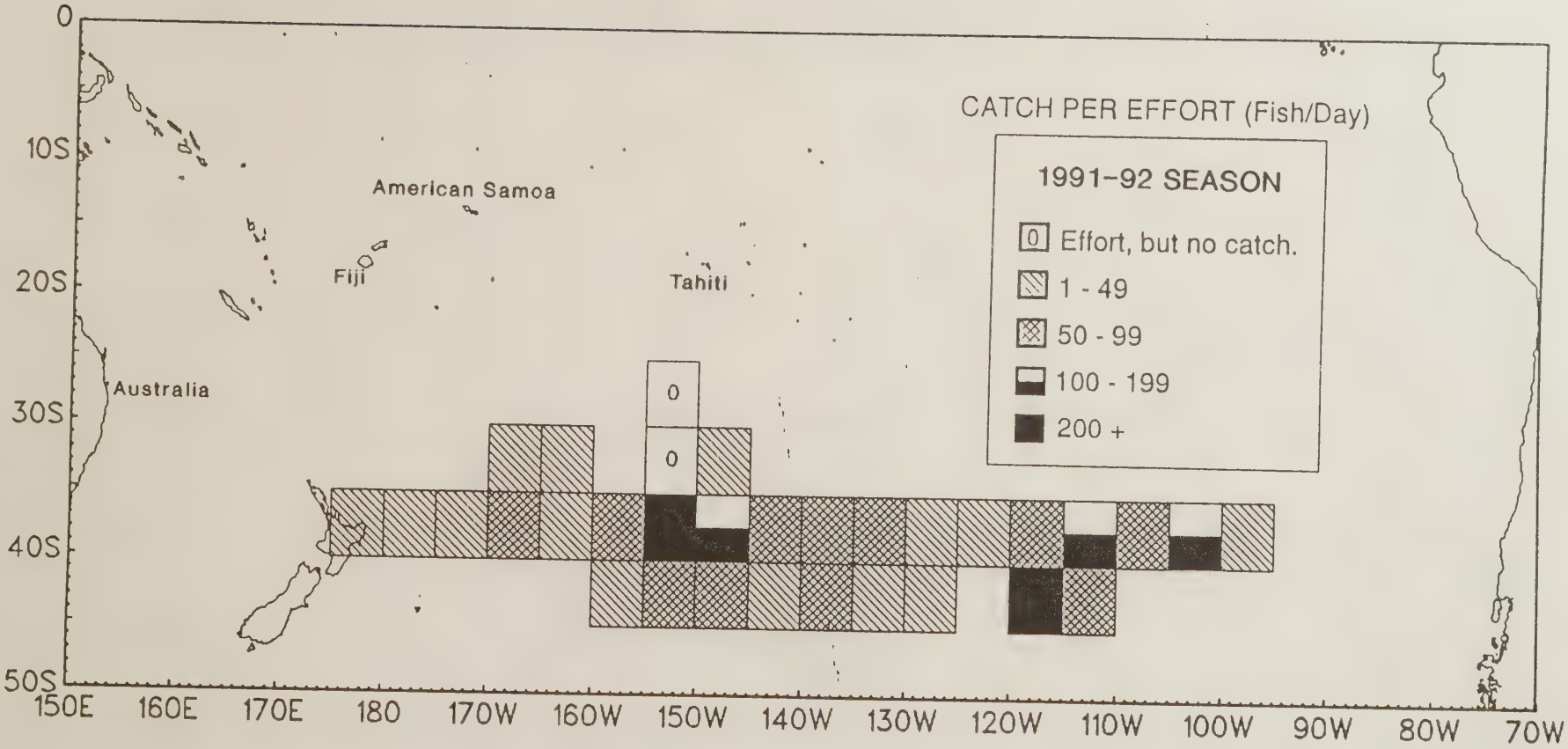

Figure 4. U.S. south Pacific albacore catch per effort (CPE) by 5° quadrangle, 1991-92 season.

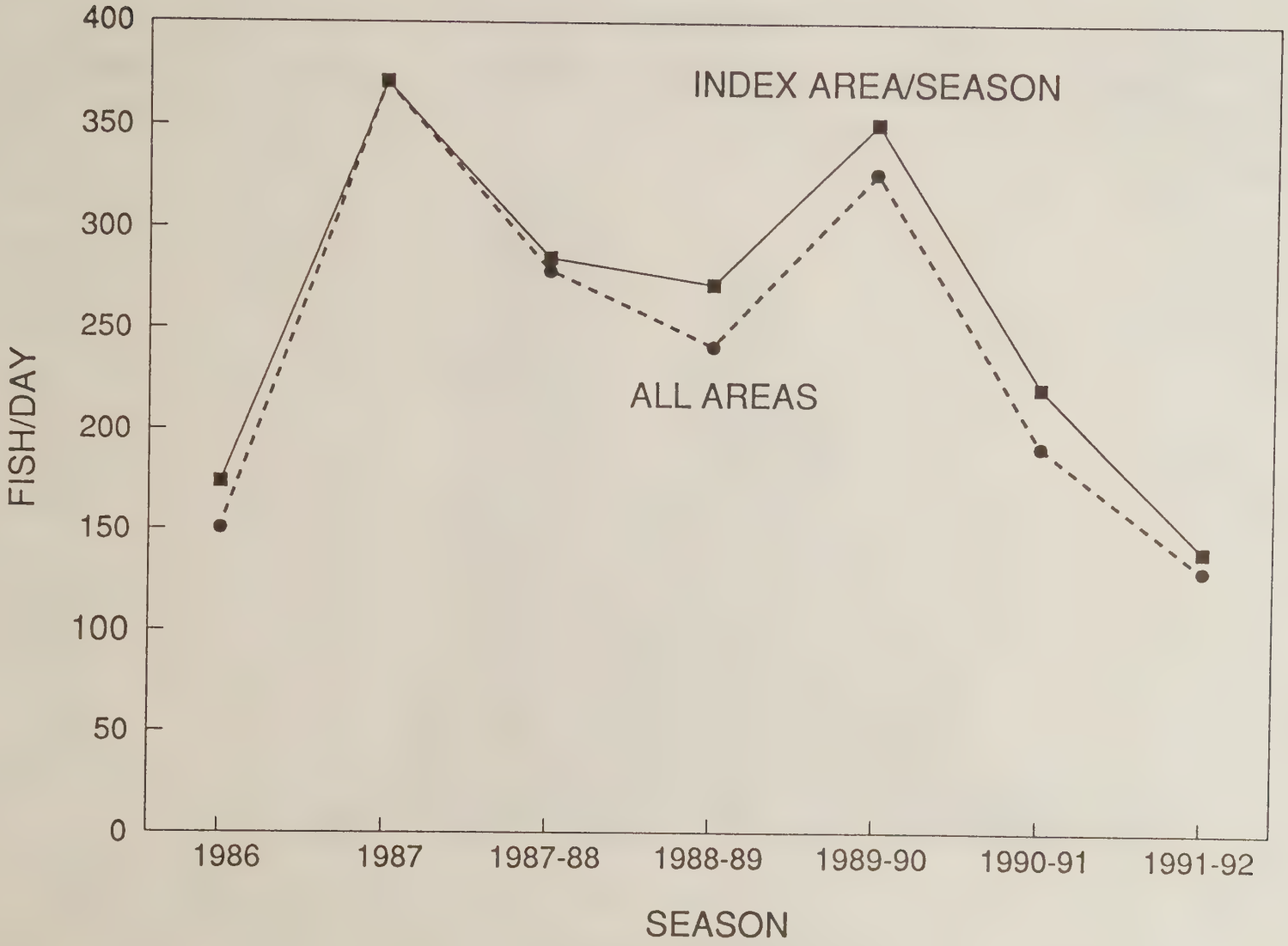

Figure 5. U.S. south Pacific albacore overall catch per effort (CPE), and CPE for the index area/season (35° - 45° S and 135° - 165° W during January-March) by season, 1986-92.

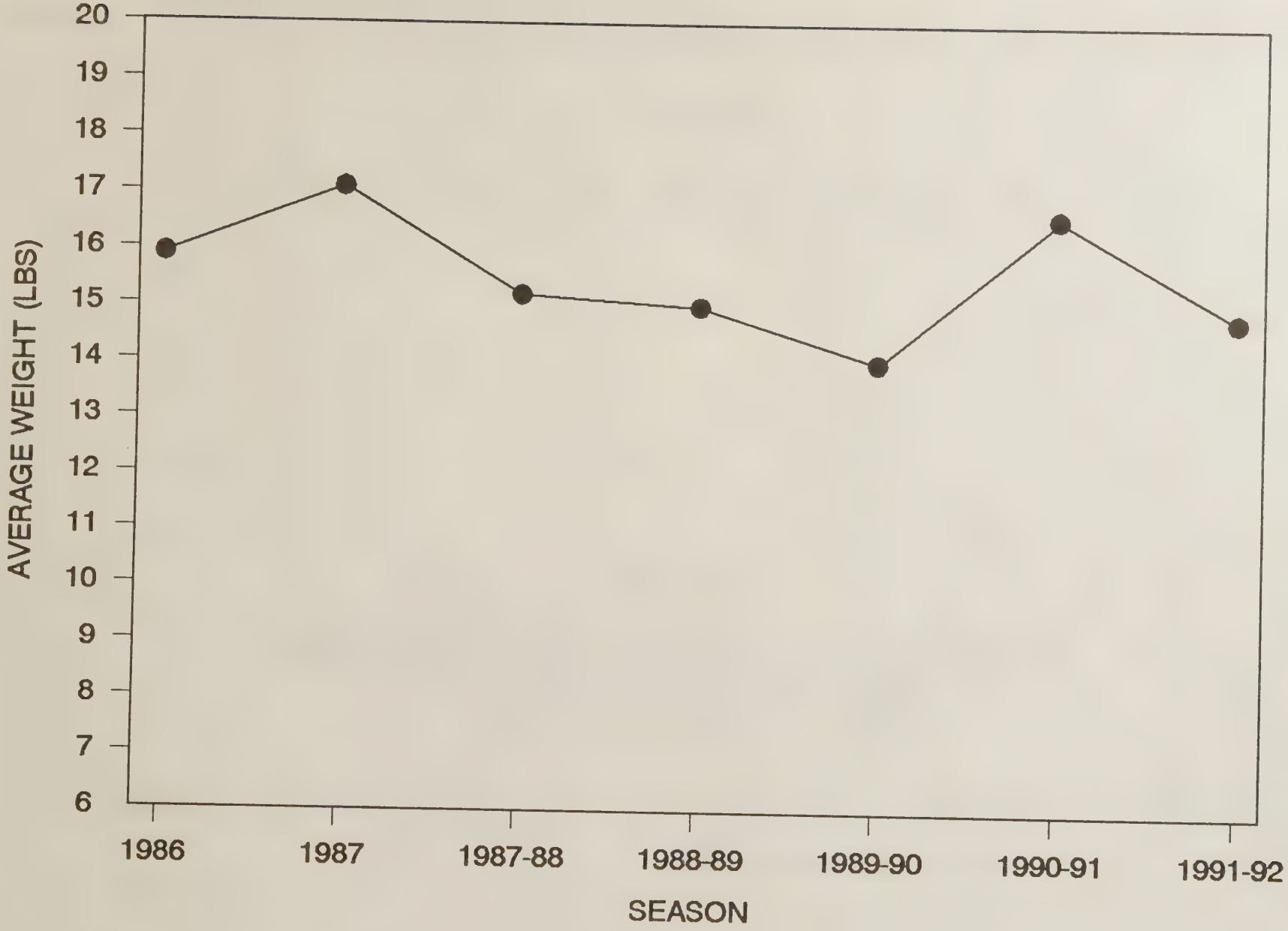

Figure 6. Average weight (pounds) of south Pacific albacore caught by the U.S. fleet by season, 1986-92.

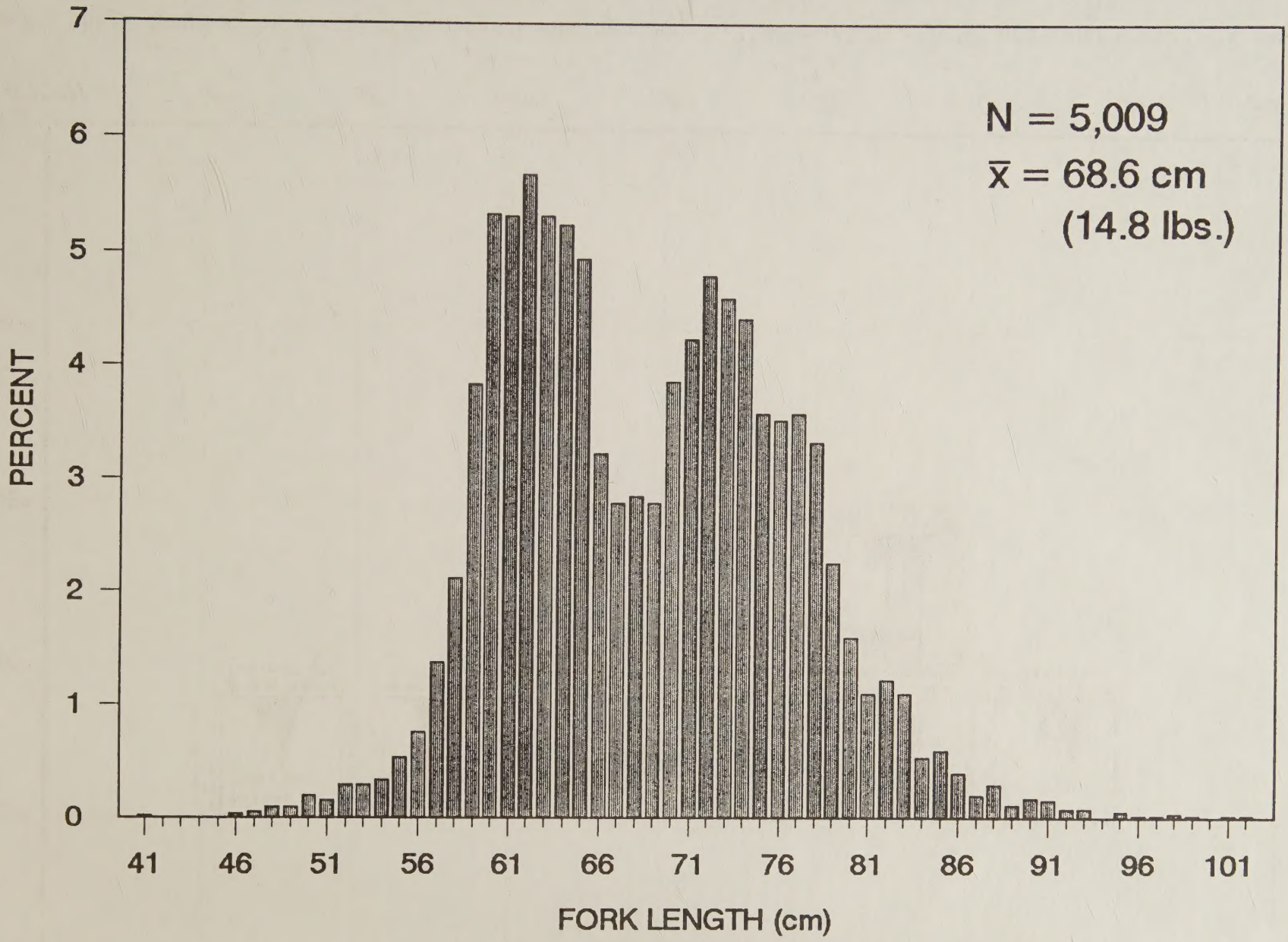

Figure 7. Length-frequency histogram of south Pacific albacore caught by U.S. vessels during the 1991-92 season.

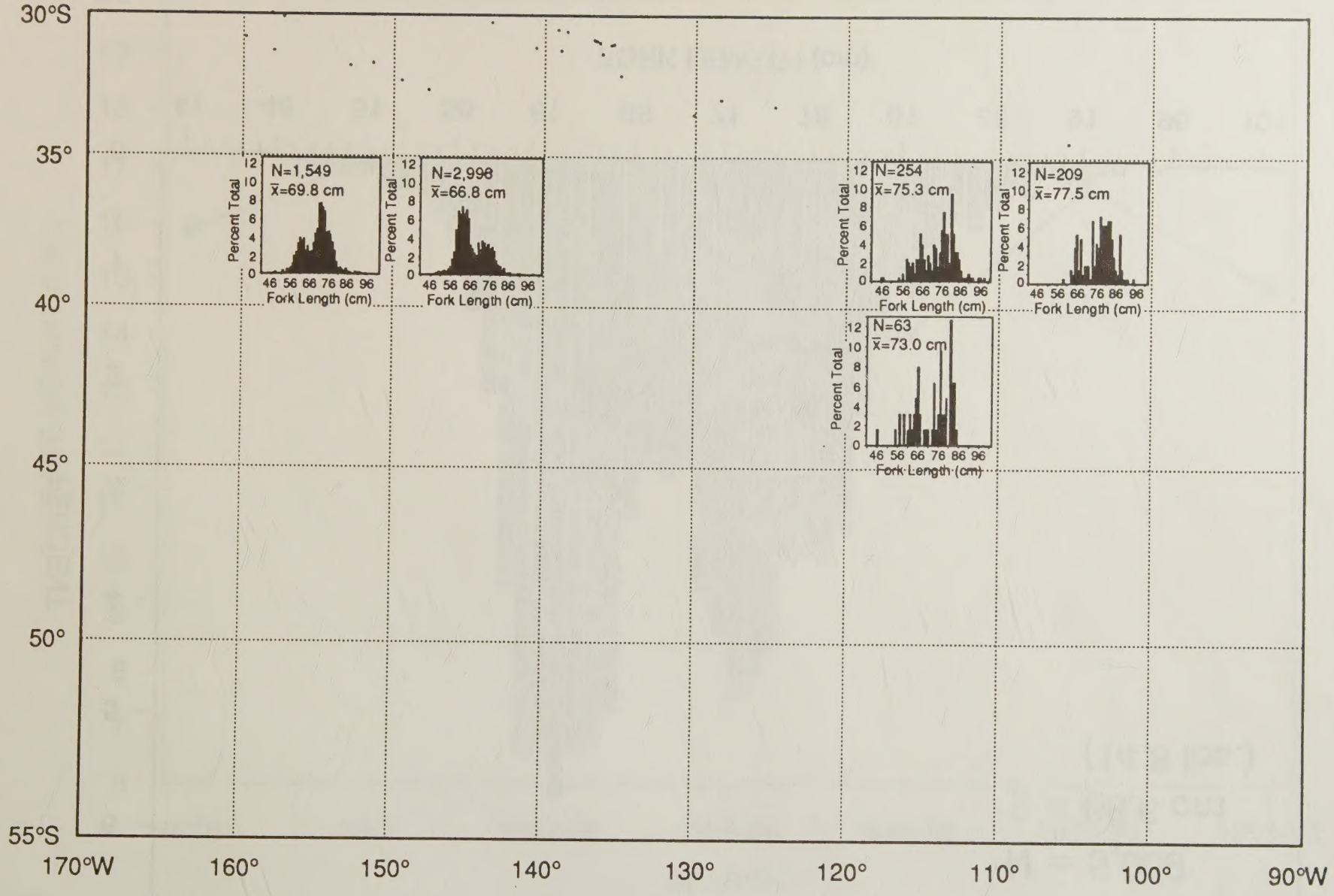

Figure 8. Length-frequency histograms of south Pacific albacore caught by U.S. vessels by 5° X 10° area during the 1991-92 season.